



(12) **United States Patent**  
**Kolhouse et al.**

(10) **Patent No.:** **US 9,410,490 B2**  
(45) **Date of Patent:** **Aug. 9, 2016**

(54) **FUEL SELECTION SYSTEM AND METHOD  
FOR DUAL FUEL ENGINES**

(71) Applicant: **Cummins Inc.**, Columbus, IN (US)

(72) Inventors: **J. Steven Kolhouse**, Columbus, IN (US);  
**Timothy P. Lutz**, Columbus, IN (US);  
**C. Larry Bruner**, Greenwood, IN (US)

(73) Assignee: **Cummins, Inc.**, Columbus, IN (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 156 days.

(21) Appl. No.: **14/174,319**

(22) Filed: **Feb. 6, 2014**

(65) **Prior Publication Data**

US 2015/0219023 A1 Aug. 6, 2015

(51) **Int. Cl.**

**F01N 3/00** (2006.01)

**F02D 19/06** (2006.01)

**F02D 41/04** (2006.01)

(52) **U.S. Cl.**

CPC ..... **F02D 19/0642** (2013.01); **Y02T 10/32**  
(2013.01); **Y02T 10/36** (2013.01)

(58) **Field of Classification Search**

CPC ..... F02D 19/0642; F02D 19/105; F02B 7/06

USPC ..... 123/27 GE, 525, 526; 60/285

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,416,244 A 11/1983 McDonald

4,619,240 A 10/1986 Bedford et al.

4,955,326 A 9/1990 Helmich

6,073,592 A 6/2000 Brown et al.

6,101,986 A 8/2000 Brown et al.

7,325,529 B2 2/2008 Ancimer et al.

2009/0070008 A1\* 3/2009 Batenburg ..... F02D 19/027  
701/103

2009/0292444 A1 11/2009 Russell

#### FOREIGN PATENT DOCUMENTS

DE 102005021491 11/2006

EP 1570163 B1 8/2006

FR 2870294 11/2005

JP 2008267324 11/2008

JP 2010030458 2/2010

WO 2007137642 12/2007

#### OTHER PUBLICATIONS

United Kingdom Search Report, GB1501503.5 Cummins Inc., dated  
Aug. 28, 2015, 2 pgs.

\* cited by examiner

*Primary Examiner* — Audrey K Bradley

*Assistant Examiner* — Anthony Ayala Delgado

(74) *Attorney, Agent, or Firm* — Taft Stettinius & Hollister  
LLP

(57)

#### ABSTRACT

Systems and methods for controlling operation of dual fuel  
internal combustion engines are disclosed. The control tech-  
niques provide for override of a dual fuel mode of operation of  
the engine by selection of a diesel only fuelling mode in  
response to one or more operating conditions of the internal  
combustion engine.

**18 Claims, 4 Drawing Sheets**

